The Educational Progress of Looked After Children in England

Technical Report 1:

Secondary School Progress and Attainment

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Aim and Objectives

The policy aim underlying this research was to improve the relatively poor educational outcomes of looked after children. The research exploited the linking of national data about the educational achievement of all children from the National Pupil Database (NPD) with local authority data on Children Looked After (CLA) and their experiences of care. This linkage provided a unique opportunity to inform future policy and practice by identifying factors that might account for the relatively poor GCSE attainments of CLA, and factors associated with substantive variations in those outcomes. This quantitative analysis, relating to GCSE attainment and progress during the secondary phase of education, compared the GCSE outcomes of CLA and other children to address three research questions:

1. What does variability in the GCSE attainments of children in care tell us about the influence of schools and local authorities on their secondary education?

2. What differences are there between children in care and other pupils in the associations between individual characteristics, such as gender, ethnicity, SEN and socio-economic status, and educational outcomes?

3. Are there contextual factors at the school and local authority levels that are associated with differences in outcomes specifically for children in care?

We proceed by describing the available data, presenting a descriptive analysis of it, presenting a multilevel (contextual value added) analysis of GCSE results, and finally summarising the conclusions.

The Data

The study used data from the English National Pupil Database (NPD) and Children Looked after Dataset (CLAD). The sample drawn from the NPD comprised the full cohort of around 640,000 English schoolchildren who were aged 15 on 1 September, 2012. The sample drawn from the 2012-13 CLAD comprised 7,852 children, of whom 6,236 were still in care on 31 March 2013, but the main focus of the statistical analysis was the smaller subset (4,849) who were looked after continuously for 12 months from 1 April 2012 to 31 March 2013 (which we abbreviate to CLA-LT). Data on both databases are linked to individual pupils using a unique pupil number (UPN), which enables the linking of personal characteristics collected in English schools censuses, examination results collected from awarding bodies, and episodes of care collected from local authorities on the SSDA903 return. It is worth noting that the group studied was older children in long-term care. Children who were only in care when they were younger, or who were in care for shorter periods, may have had different experiences of and outcomes from education.

The NPD provides data on attainment at National Curriculum key stages, attendance at school and exclusions from school. The SSDA903 return provides data on episodes of care and placements, such as dates, legal basis, locations, and providers involved in the children's different placements, categories of placement (e.g. whether fostered with unrelated carers or with family or friends) and their destinations upon leaving the system (e.g. whether they were adopted or returned to their birth families). Both sources provide basic demographic data. To simplify the analysis, pupil-level data on absences and exclusions from school were aggregated over the five school years of the secondary phase of education; data on episodes of care were aggregated to the child level. (The availability of dates for care placements, absences and exclusions from school, and attainment tests would make it feasible to undertake a more time-oriented analysis, but that was beyond the remit of this project).

Because this study was concerned with comparisons between CLA and others, it dealt with variables available for both groups, i.e. data from the NPD, not data only available on the CLAD. The variables we examined were those known to be substantively important predictors of GCSE outcomes in contextual value-added (CVA) models. The pupil level variables were:

i. demographic characteristics: gender, ethnicity and language spoken at home
ii. eligibility for free school meals (FSM), which is usually regarded as a proxy for family poverty or socio-economic status
iii. neighbourhood deprivation, as measured by the Income Deprivation Affecting Children Index (IDACI) for the postcode of residence of the child
iv. special educational needs (SEN), which we decided to break down by primary type of need
v. changes of school, between and within school years
vi. absences from school, broken down into authorized and unauthorized, and
vii. exclusions from school (number and duration for fixed-term exclusions and whether permanently excluded).

The school-level variables we used were school type and aggregates of pupil-level measures of key stage 2 attainment, eligibility for FSM, and SEN status. We tested as predictors similar aggregates at the local authority level. Definitions and census dates of variables employed are shown in Appendix A.

A useful insight emerging from this work was that children who are 'in need' (CIN), being more similar to CLA than other children in their personal characteristics and their experiences of education, make a useful comparison group. We start by discussing the relationship between being in need and looked after. Then we contrast the three groups (CLA, CIN and other) using descriptive statistics. We then report on a comparison of the GCSE outcomes of looked after and other children using a multilevel analysis. Finally, we discuss the results, their possible policy implications and potential avenues for future research.

Looked after Children and Children in Need

Whether children are classified as 'looked after' is determined by services they receive from the local authority in whose area they reside. Under Section 20 of the Children Act 1989, local authorities must provide accommodation for a child in need of it, and under Section 31 of the Act must prepare a care plan for the future of a child who is the subject of an application for a Care Order. Such children are deemed to be looked after. Comparisons with the wider population of schoolchildren enable quantification of the net disadvantage CLA suffer in their GCSE results, but there is no simple way of disentangling the disadvantage CLA suffer as a result of their personal circumstances and the (presumed) mitigating benefit of local authority support. However, local authorities have a more general duty under Section 17 of the 1989 Act to "safeguard and promote the welfare of children within their area who are in need". Like CLA, children in need (CIN) come from poorer backgrounds, more often have identified special educational needs and have poor GCSE results. Greater in number than CLA, they provide a more comparable benchmark. Table 1 shows the numbers in each group for the cohort we studied.

Table 1: Children in Need (CIN) and Children Looked after (CLA) Eligible to take their GCSEs in June 2013

	Count	%
Not in need or looked after on 31st March 2013	622,970	96.9%
In need on 31st March 2013	13,599	2.1%
Looked after on 31st March 2013 for less than a year	1,387	0.2%
Looked after on 31st March 2013 for over a year	4,849	0.8%

Note. The above are mutually exclusive categories totalling to 642,805 pupils in the entire cohort.

A child who is looked after should always qualify as in need because, in the words of the Act, they need local authority services either "to achieve or maintain a reasonable standard of health or development", or "to prevent harm to their health or development". There was a seeming misalignment of the registration and de-registration processes, with small numbers of children on the CLAD but not the CIN database on 31st March 2013. The numbers involved were too few to influence findings.

CLA on the census date represented close to one per cent (6,236) of the cohort. CLA-LT comprised nearly four fifths (4,849) of those looked after on the census date. In addition to those who were looked after on 31st March 2013, just over 2% (13,599) of the cohort were in need at that time.

Descriptive Analysis

The descriptive analysis that follows compares CLA-LT with those who were looked after on 31st March, 2013 but for less than 12 months, with those who were in need but not looked after on 31st March, 2013 and with those who were neither looked after nor in need. It proceeds from demographic characteristics through indicators of poverty and educational need, to experiences of school in terms of attendance, exclusion and attainment.

Gender

Table 2 shows that girls were slightly over-represented on the CIN database, and among those looked after for less than twelve months. Conversely, boys were slightly over-represented among CLA-LT. The latter is not surprising, given that assessments of needs are more likely to have been undertaken among CLA-LT and more boys than girls are assessed as having behavioural, emotional and social difficulties.

Table 2: Looked after status by gender

	F		M	
	Count	%	Count	%
Not in need or looked after on 31st March 2013	303,869	48.8%	319,101	51.2%
In need on 31st March 2013	6,838	50.3%	6,761	49.7%
Looked after on 31st March 2013 for less than a year	699	50.4%	688	49.6%
Looked after on 31st March 2013 for over a year	2,144	44.2%	2,705	55.8%

Ethnic group and First Language

Table 3 shows that white British children are slightly over-represented amongst CIN but not amongst CLA.

Table 3: Looked after status by ethnicity

	White British	Asian and Black African	Black Caribb-ean and MWBC*	Other mixed	Traveller	Other
Not in need or looked after on 31st March 2013	70.1%	10.5%	2.5%	2.3%	0.2%	4.9%
In need on 31st March 2013	75.0%	8.8%	4.2%	3.1%	0.4%	4.3%
Looked after on 31st March 2013 for less than a year	70.7%	7.4%	6.1%	3.8%	0.8%	4.6%
Looked after on 31st March 2013 for over a year	70.6%	6.3%	5.1%	3.3%	0.2%	4.0%

** MWBC= Mixed White and Black Caribbean.*

Starker differences occur among ethnic minority groups, with the Asian and Black African groups under-represented compared to white British students among those CLA/CIN and with disproportionately high numbers of Black Caribbean and Mixed White and Black Caribbean (MWBC) children, especially in the looked after group.

Table 4 reveals that children whose first language is not English are less often identified as in need and are less often admitted into care by local authorities. Comparison with Table 3 suggests that first language is less powerful than ethnic group as a predictor of being in need or looked after.

Table 4: Looked after status by first language

	English	Believed to be English	Other than English	Believed to be Other
Not in need or looked after on 31st March 2013	86.3%	0.6%	12.6%	0.6%
In need on 31st March 2013	89.6%	0.7%	9.3%	0.4%
Looked after on 31st March 2013 for less than a year	89.4%	0.3%	10.1%	0.2%
Looked after on 31st March 2013 for over a year	91.8%	0.9%	7.0%	0.4%

Family Poverty

Eligibility for free school meals (FSM) is generally determined by parental entitlement to means-tested benefits, such as Income Support. Table 5 shows that children who receive local authority services are far more often eligible for FSM than those who do not, indicating that children from poorer families are at greater risk of needing such services.

Table 5: Eligibility for Free School Meals (Ever 6*)

	Not eligible for free school meals		Eligible for free school meals	
	Count	%	Count	%
Not in need or looked after on 31st March 2013	478,027	76.7%	144,943	23.3%
In need on 31st March 2013	5,717	42.0%	7882	58.0%
Looked after on 31st March 2013 for less than a year	655	47.2%	732	52.8%
Looked after on 31st March 2013 for over a year	3,073	63.4%	1776	36.6%

* Eligibility for FSM in any of the 6 years preceding GCSEs. The percentages may understate CIN and CLA levels of entitlement for FSM because when some school types (in which CIN and CLA were over-represented) did not supply the data, a child was recorded in the NPD as not eligible.

In the cohort as a whole, less than a quarter of children were eligible, but over half of children in need and children who were looked after for less than twelve months had been eligible for FSM. The proportion eligible for FSM was a little over a third for CLA-LT but under-reporting by certain school types, rather than greater affluence of their families, may account for this (see table footnote).

Another proxy for family poverty is the Indicators of Deprivation Affecting Children Index (IDACI) – a measure of deprivation in the postcode in which a child lives. Table 6 shows that in 2013 CLA-LT lived in areas approximately as affluent as children who were not in need. However, the trajectories of IDACI scores over time tell another story.

Table 6: Income Deprivation Affecting Children Index (IDACI) 2004-2013

	2004	2008	2011	2013	Latest available 2004-2013
Not in need or looked after on 31st March 2013	0.221	0.229	0.219	0.217	0.217
In need on 31st March 2013	0.306	0.311	0.291	0.288	0.293
Looked after on 31st March 2013 for less than a year	0.326	0.326	0.301	0.254	0.271
Looked after on 31st March 2013 for over a year	0.327	0.287	0.238	0.219	0.234

The mean 2004 IDACI score (0.327) for those who had been in their latest placement longest was in the 27th percentile of IDACI scores for the cohort. The mean IDACI scores of CIN and CLA improved (i.e. reduced score) significantly between 2004 and 2013, with the initial (average) deprivation being greatest for those who were looked after and the convergence towards the overall cohort mean being greatest for CLA-LT. A reasonable inference is that children who were looked after came from very deprived families (on average), but that children in longer-term local authority care ended up in placements located in areas of nearly average deprivation.

The mean IDACI scores of children in need but not looked after improved, but by much less, over the nine years. It seems reasonable to assume that IDACI is (and eligibility for FSM would be) a better indicator in 2004 than in 2013 of the poverty of birth families of CIN and CLA.

Table 7: Correlations between neighbourhood deprivation at four school census dates

		2004	2008	2011	2013
Not in need or looked after on 31st March 2013	**2004**	1	.614**	.507**	.462**
	2008	.614**	1	.628**	.554**
	2011	.507**	.628**	1	.732**
	2013	.462**	.554**	.732**	1
In need on 31st March 2013	**2004**	1	.566**	.481**	.442**
	2008	.566**	1	.585**	.519**
	2011	.481**	.585**	1	.698**
	2013	.442**	.519**	.698**	1
Looked after on 31st March 2013 for less than a year	**2004**	1	.505**	.388**	.328**
	2008	.505**	1	.486**	.371**
	2011	.388**	.486**	1	.526**
	2013	.328**	.371**	.526**	1
Looked after on 31st March 2013 for over a year	**2004**	1	.378**	.203**	.133**
	2008	.378**	1	.418**	.255**
	2011	.203**	.418**	1	.525**
	2013	.133**	.255**	.525**	1

Changes in the neighbourhood deprivation of CIN and CLA are also illustrated by correlations between the measures of neighbourhood deprivation at different school censuses. In Table 7, we show correlations between the IDACI scores of pupils broken down by in need and looked after status. The stability of the neighbourhood deprivation of children who were not in need or looked after is indicated by high correlations between the deprivation indices at different school censuses. Even between 2004 and 2013, the correlation between IDACI scores is close to a half. For children who were in need but not looked after, the correlations were marginally lower but still over 0.4 between 2004 and 2013. For children who were looked after on the census date but for less than twelve months, the correlations were lower again. For CLA-LT, the correlations between IDACI scores at different school censuses were considerably lower, and very low indeed (0.133) between 2004 and 2013. Notwithstanding the other differences, for the two groups who were looked after on the census date, the correlations between 2011 and 2013 were very similar. All of this is consistent with children changing their place of residence when they move into care, and with the nature of the placement being largely unrelated to birth family poverty.

We do not show the corresponding table for eligibility for free school meals, because the message is the same (but with slightly lower correlations throughout the table).

Special Educational Needs

One of the prominent characteristics of children who are in need or looked after is the high proportion with special educational needs (SEN). Table 8 shows that for children who are not CIN or CLA, the proportion who have SEN at school action plus or a statement of educational need is approximately 16%, but for those who had been looked after for over a year on the census date, the proportion was over 70%, for those looked after for less than a year it was slightly over 60% and for those who were identified as in need on 31st March 2013 it was 59%.

Table 8: Looked after status by level of Special Educational Need

	No special need	School action	School action plus	State-mented
Not in need or looked after on 31st March 2013	64.8%	19.5%	12.3%	3.4%
In need on 31st March 2013	23.3%	17.7%	27.4%	31.6%
Looked after on 31st March 2013 for less than a year	21.0%	17.8%	40.3%	20.9%
Looked after on 31st March 2013 for over a year	13.5%	14.9%	41.3%	30.3%

However, the difference within categories of need according to looked after status extends beyond the simple proportion of those with needs. Table 9 and Table 10 give a breakdown by type of SEN *for those who had a special educational need*. The largest differences in propensities to particular needs are for moderate or specific learning disability and having a speech, language or communication need. In all three cases, the proportions are much higher for children who are not in need or looked after. Conversely, whereas a little over a quarter of those not in need or looked after had a behavioural, emotional or social difficulty, over a half of those who were looked after did so.

Table 9: Looked after status by type of SEN (part 1)

	Behavioural emotional and social	Moderate learning difficulty	Specific learning difficulty	Speech, language and communication
Not in need or looked after on 31st March 2013	28.2%	26.4%	15.8%	9.9%
In need on 31st March 2013	32.0%	18.0%	5.7%	3.9%
Looked after on 31st March 2013 for less than a year	58.7%	17.0%	4.8%	2.5%
Looked after on 31st March 2013 for over a year	50.4%	19.8%	5.2%	3.8%

The pattern is more mixed for the smaller categories of SEN shown in Table 10. Probably the most noteworthy proportions are those for children with severe or multiple learning difficulties, for whom the proportions are quite high in the two looked after sub-groups but extremely high for CIN. Similarly, there is a higher proportion of children with autism spectrum disorder in the CIN group.

Table 10: Looked after status by type of SEN (part 2)

	Autism spectrum disorder	Sensory impairment	Severe or multiple learning difficulties	Physical and other disabilities
Not in need or looked after on 31st March 2013	6.6%	3.1%	1.8%	8.1%
In need on 31st March 2013	12.3%	2.3%	16.7%	9.0%
Looked after on 31st March 2013 for less than a year	5.4%	1.7%	4.8%	5.2%
Looked after on 31st March 2013 for over a year	5.4%	1.0%	6.5%	7.9%

Note: A complete cross-tabulation with number and percentages is given in Appendix B.

The general picture suggests that CIN and CLA who have SEN more often have needs likely to significantly affect their education than children who are not deemed to be in need or looked after. This is also consistent with local authorities categorising children as in need if they have a significant educational need because of their duty to "maintain a reasonable standard of health or development", but taking into care those who have significant behavioural difficulties. What we do not know from these data is whether, within these types of SEN (and especially BESD), the needs of CIN and CLA tend to be greater than those of other children.

Secondary School Types

Differences in the types of secondary provision attended by children in need and those looked after were very pronounced for the three groupings of school types shown in Table 11. High percentages of CIN and CLA complete their secondary education in special schools, pupil referral units (PRUs) and local authorities' alternative provision (AP). The relatively higher numbers of CLA in PRUs and AP tally with the higher incidence of behavioural needs identified for this group, as well as suggesting that the needs are acute for a significant number.

Table 11: Looked after status by types of secondary school attended at GCSE

	Special school*		Pupil Referral Unit / Alternative provision		Independent	
	Count	**%**	**Count**	**%**	**Count**	**%**
Not in need or looked after on 31st March 2013	8,010	1.3%	8,012	1.3%	47,061	7.6%
In need on 31st March 2013	3,204	23.6%	1,162	8.5%	86	0.6%
Looked after on 31st March 2013 for less than a year	190	13.7%	319	23.0%	11	0.8%
Looked after on 31st March 2013 for over a year	1,061	21.9%	595	12.3%	42	0.9%

* Including independent special schools. A complete cross-tabulation is given in Appendix C.

Differences between the intakes of secondary schools attended by CIN, CLA and other children are quite pronounced. Table 12 shows that children in need and looked after attended schools in which mean attainment at Key Stage 2 was lower than average, and eligibility for free school meals was higher. The half point difference in mean KS2 points between CLA and children who were not in need or looked after represents a full year of learning on the national curriculum.

Table 12: Looked after status and school aggregates

	School mean KS2 points	Proportion of pupils eligible for FSM
Not in need or looked after on 31st March 2013	4.7	24%
In need on 31st March 2013	4.4	31%
Looked after on 31st March 2013 for less than a year	4.1	35%
Looked after on 31st March 2013 for over a year	4.2	29%

The school-level differences in KS2 attainment and eligibility for FSM are not as large as the child-level differences, (i.e. between CIN, CLA and other children). Comparison of Table 12 with Table 5 (FSM)

and Table 15 (KS2 average scores) reveals that CIN and CLA pupils, on average, attend schools at which their peers are less likely to be eligible for FSM and have higher average KS2 attainment than themselves[1].

Changes of School

One aspect of secondary education known to be strongly associated with poor progress is change of school, particularly during term-time. Table 13 reveals that far higher proportions of CIN and CLA change school during secondary education, particularly during Key Stage 4 (years 10 and 11) and during term-time. Children who are looked after seem especially prone to moving schools, explained in part by the numbers who complete their secondary education in a pupil referral unit or alternative provision. While instability in the school environment might have a direct impact on GCSE results, the root causes of both are unlikely to be captured on administrative databases like the NPD.

Table 13: Percentages of children changing secondary school

	Year 10 or 11 between July and September	Year 10 or 11 between October and June	Year 9 between October and June	Year 7 or 8 between October and June
Not in need or looked after on 31st March 2013	2.8%	5.7%	2.5%	4.4%
In need on 31st March 2013	10.4%	11.5%	7.5%	8.7%
Looked after on 31st March 2013 for less than a year	22.6%	14.3%	15.1%	12.5%
Looked after on 31st March 2013 for over a year	11.3%	13.9%	11.5%	12.3%

Another dimension to the greater educational instability of children who are in need or looked after is the higher numbers of absences and exclusions they experience during secondary school. Table 14 shows that on average CIN and CLA generally experienced more absences and exclusions from school than other children did. The only notable exception was the number of authorised absences for CLA-LT, which was actually lower than for children who were not receiving local authority support.

[1]There is an extensive literature on peer effects but no conclusive evidence as to whether having higher attaining peers or peers from less impoverished backgrounds is beneficial or detrimental. The inclusion of contextual aggregates in value-added models takes account of such effects whatever their direction. See Timmermans, A., & Thomas, S. M. (2014). The impact of student composition on schools' value-added performance: a comparison of seven empirical studies. *School Effectiveness & School Improvement.* 26:3, 487-498.

Table 14: Absences[2] and exclusions from school of looked after and other children

	Authorised absences (half days) in total	Unauthorised absences (half days) in total	Number of fixed-term exclusions in total	Sessions excluded (fixed-term) in total	Percentage of pupils ever permanently excluded
Not in need or looked after on 31st March 2013	73.8	17.1	0.4	1.8	0.6%
In need on 31st March 2013	117.2	70.9	1.7	8.7	3.9%
Looked after on 31st March 2013 for less than a year	114.6	88.6	3.2	17.0	8.0%
Looked after on 31st March 2013 for over a year	69.1	35.6	2.3	11.8	3.3%

The differential between averages is more pronounced for exclusions than for absences, with CIN and CLA experiencing between 4 and 13 times as many exclusions as other children. Children who entered LA care in the 12 months preceding 31st March 2013 experienced far more exclusions than CIN and children who were looked after in the longer term, a fact perhaps related to potential benefits from care.

Perhaps unsurprisingly, there seems to be an association between exclusion and changes of school. The differences in the percentages permanently excluded (final column of Table 14) are likely to account for a significant part of the differences in the percentages changing school during KS4 (first two columns of Table 13).

Progressive Attainment

Table 15 shows that children who were in need or looked after had lower attainment scores on average at Key Stages one to four. While the poorer performance of CIN and CLA is the most notable feature of this table, there are also significant differences between the sub-groups. In particular, children who were in care for the twelve months before 31st March 2013 had the lowest attainment at KS1, but steadily gained ground on CIN and those admitted to care in the final year, and had overtaken them both by GCSE. Those who were looked after but not continuously for 12 months (i.e. who were admitted to care - not necessarily for the first time - in the final year of their secondary education) were overtaken between the KS3 and KS4 tests by CIN.

[2] Absence data for PRUs and AP are not included in these data, but the understatement of absences, though greater for CLA and CIN than for other children, is probably quite small. Table 11 showed that around 1 in 8 CLA were in PRUs and AP at KS4, but that represents a maximum. The numbers in PRUs and APs increased throughout the secondary phase, and the absence data in Table 14 relate to the whole period (KS3 and KS4).

Table 15: Looked after status by attainment at Key Stages

	KS1 points, 4 test average	KS2 points, 3 test average	KS3 points, 3 test average	KS4 points, 8 best + equivalents
Not in need or looked after on 31st March 2013	15.7	4.65	5.56	341
In need on 31st March 2013	11.5	3.84	3.90	185
Looked after on 31st March 2013 for less than a year	12.4	4.01	4.29	150
Looked after on 31st March 2013 for over a year	11.2	3.88	4.21	202

Because the attainment scores at KS2 and KS3 are nominally on the same metric, it might seem that children in need and looked after made very meagre progress during Key Stage 3. A slightly deeper investigation of the test scores revealed that children who performed below the level of the test at KS2 were given a score of 2.5, whereas those who performed worst at KS3 were given a score of zero. This apparent decline in attainment from 2.5 in the KS2 tests to zero in the KS3 tests applies disproportionately to CIN and CLA. That is, their performance at KS2 relative to other children was rather worse than these numbers suggest. A likely consequence of the artificial 'floor' for KS2 attainment is a weakening of the relationship between KS2 results and GCSE outcomes. Because of the disproportionate numbers of CIN and CLA performing below the level of the KS2 test, we might expect that, in a regression model for GCSE outcomes, the coefficients on the KS2 score will be smaller for CIN and CLA than for other children.

Multilevel Analysis of GCSE Outcomes

The descriptive analysis above indicates that CLA (whether CLA-LT or otherwise), had similar educational disadvantages to CIN, and Table 15 suggests that CLA-LT made better progress than CIN and other CLA by KS4 having attained at a slightly lower level at the end of the previous three Key Stages. However, judgements about the impact on education of being looked after in the short or long term depend on taking simultaneous account of the many variables that relate to attainment. This requires regression analysis, so the second part of the analysis fitted a regression model to attainment at Key Stage 4 (i.e. GCSE results). Taking account of previous attainment (at Key Stage 2) made this a value-added model. To gauge the influence of schools and LAs, we fitted a model with three levels, with pupils nested within schools, and schools nested within local authorities. Multiple membership models that allow for children changing schools capture more variation at higher levels (Leckie, 2009[3]), but the difference is not likely to be so great as to alter the substantive conclusions, and computer processing for such complex models is a significant constraint with such a large sample (640,000 pupils). The use of contextual aggregates at the school and LA levels made this a contextual value-added (CVA) model. We fitted the model using MLwiN V2.35[4].

We related the disadvantage experienced by CLA and CIN at GCSE to the available data by starting with a model that had mutually exclusive 'In need' and 'looked after' flags as the only explanatory variables, and then adding further explanatory terms relating to the child, the school and the local authority. Models for GCSE point scores (raw, VA and CVA) illustrate how the successive addition of prior

[3] Leckie, G. (2009). The complexity of school and neighbourhood effects and movements of pupils on school differences in models of educational achievement. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *172*(3), 537-554.
[4] http://www.bris.ac.uk/cmm/software/mlwin/

attainment, individual characteristics and contextual variables affect the fixed coefficient on being in care, random effects[5] at the school and local authority levels, and residual variances[6] at all levels.

To test for differences between CLA, CIN and other children, we also fitted interaction terms between individual characteristics and the CLA and CIN flags in the fixed parts of the models, and examined random effects for different groups at the school and LA levels in the random parts of the models. We tested absences and exclusions as mediating factors in these models, again allowing coefficients to differ across the different groups. We fitted separate models for overall attainment (GCSE and equivalent Best 8 point score) and for English and Mathematics, although only the GCSE Best 8 point score results are presented here.

Raw Differences in GCSE Scores

The simplest estimates of the differences between the GCSE outcomes of children who are looked after, in need and neither are obtained from a regression model with no other explanatory terms and without taking into account education hierarchy of schools and local authorities. The coefficients in the second column of Table 16 are consistent with the simple averages shown in Table 15. The constant (340.6) represents the mean performance of pupils who were not in need or in care on 31st March 2013. It corresponds to eight GCSEs with an average grade just above D. Those who were in need but not in care scored 155.5 points lower, equivalent to averaging more than three grades lower in all eight subjects. Those who were in care but for less than twelve months performed slightly worse than CIN (by 36 points, or roughly six GCSE grades spread over their eight best results), but CLA-LT performed rather better than CIN (by 17 points or roughly three GCSE grades).

Table 16: Raw GCSE points model

Explanatory term	Non-hierarchical model	Three level raw model
Constant (not CLA or CIN)	340.6	272.7
In need on 31 March 2013	-155.5	-72.3
Looked after on 31st March 2013 for less than a year	-191.1	-94.9
Looked after on 31st March 2013 for over a year	-138.2	-53.5

The imposition of a hierarchical structure on the data had a large impact on these coefficients. The large differences between the numbers in the two columns on the right of Table 16 are accounted for by the school level, because hierarchy was the only change in the model and there was no significant variation at the LA level after its addition. In other words, a very large proportion of the apparent disadvantage in the attainment of children who were in need or looked after was associated with the schools they attended. There is always uncertainty in models of this kind as to whether different outcomes at the school level arise from variation in school effectiveness (in this case, for example, because children in need and looked after attended 'worse' schools) or from sorting, either on measured characteristics such as attainment at age 11 or on unmeasured characteristics (such as pupil need or parental engagement). However, the magnitude of

[5] Random effects refer to variability among schools or local authorities in the average outcomes of pupils with particular characteristics. The random effects we considered in our models pertained to children who were "In need" or "looked after". One explanation for random effects in our model would be differential effectiveness of schools or local authorities in achieving GCSE outcomes specifically for these children.

[4] Residual variance refers to the amount of variability in outcomes that is not explained by a statistical model. One explanation for residual variance at the school or local authority level in our model would be differential effectiveness of schools or local authorities in achieving GCSE outcomes for all children.

these effects is far too great to attribute them simply to school effectiveness. We address this question in more detail when we look at contextual effects and types of secondary school attended.

Taking Account of Prior Attainment

Because the principal concern in this study was progress during the secondary phase of education, we next fitted a model that took account of previous attainment, using 'finely-graded' scores in the three Key Stage 2 (KS2) tests taken at age 11. KS2 attainment is a powerful predictor of GCSE outcomes. We discuss the large reduction in unexplained variation in GCSE outcomes later, when we examine variability in outcomes at different levels in the education hierarchy. Here, we focus on changes in the fixed coefficients.

Table 17: GCSE Points - Coefficients in a simple Value-Added model

Explanatory term	Three level raw model	Value-added model
In need on 31 March 2013	-72.3	-53.9
Looked after on 31st March 2013 for less than a year	-94.9	-80.4
Looked after on 31st March 2013 for over a year	-53.5	-30.7
KS2 English points		30.5
KS2 Maths points		20.4
KS2 Science points		12.4

Table 17 shows that the changes in the coefficients for children in need (CIN) and who were looked after (CLA) were substantial after accounting for KS2 attainment. All three negative coefficients reduced in magnitude, signifying that poorer KS2 attainment explains part of the poorer performance of CIN and CLA at GCSE. Again, the changes (of 18, 14 and 23 points) equate to between two and four GCSE grades spread across their eight best results. The ordering of the coefficients for the three groups is unaffected: those in long-term care performed better than those in need, who in turn performed better than those in care for less than 12 months. Causal inferences are fraught with risk. The most we can conclude is that the worse performance of those admitted to care in the year preceding their GCSEs is consistent with the circumstances surrounding their entry into care having an adverse impact on their education, and the better performance (compared to CIN) of those looked after for 12 months is consistent with continuing care having a protective effect. By adding further explanatory variables captured on the NPD, we investigated the extent to which these differences can be related to other known characteristics of these children.

Taking Account of Demography and Deprivation

We began by adding pupil-level, explanatory variables relating to demography and deprivation. For reasons of parsimony, we grouped ethnicity into seven categories (including "not known"). We were guided in this grouping by the coefficients in CVA models produced by the DfE, and by differing propensities in the model we fitted to being looked after. We neither attach special significance to the classification we arrived at nor attempt to interpret any of the coefficients causally.

Table 18: Demography and Deprivation - Fixed coefficients

	Value-added model	Demography and deprivation
In need on 31 March 2013	-53.9	-50.1
Looked after on 31st March 2013 for less than a year	-80.4	-78.3
Looked after on 31st March 2013 for over a year	-30.7	-30.8
KS2 English points	30.5	23.8
KS2 Maths points	20.4	23.0
KS2 Science points	12.4	13.6
Male		-17.7
Asian and Black African		16.0
Black Caribbean and mixed White and Black Caribbean		3.9
Other mixed		6.4
Traveller		-51.4
Other ethnicity		14.0
Ethnic origin not known		-3.9
Non-English speaking		14.3
Eligible for FSM in any of the 6 years preceding GCSE		-14.1
Indicators of Deprivation Affecting Children index (IDACI)		-35.5

The addition of these variables had no substantive impact on the coefficients associated with being in need or looked after. The changes in the coefficients in the top three rows of Table 18 all equate to a fraction of one GCSE grade. There was a substantive change in the coefficient for KS2 English, primarily because girls score higher in that subject – the addition of gender to the model meant that KS2 English ceased to serve as a proxy for being female. This is not pertinent to the questions we are studying.

Special Educational Needs

Special educational needs (SEN) are far more prevalent amongst CLA (and CIN) than among other children, making it very important to explaining why CLA have poorer GCSE outcomes. To illustrate how much of the difference SEN explains, we added this explanatory variable to the model separately from the other pupil-level variables. The DfE's CVA model uses only a dichotomous variable but we decided to take account of type of need, because CIN and CLA might have specific needs that are associated with greater educational disadvantage. We included in our model separate coefficients for each primary type of SEN (for those children whose SEN status was at least 'school action plus'). The changes in the coefficients arising from the addition of primary type of SEN are shown in Table 19.

Table 19: GCSE Points – Fixed coefficients in a Value-Added model including SEN

	Demography and Deprivation model	Special Educational Needs model
In need on 31 March 2013	-50.1	-44.6
Looked after on 31st March 2013 for less than a year	-78.3	-68.4
Looked after on 31st March 2013 for over a year	-30.8	-19.4
Behavioural, emotional and social difficulties (BESD)		-45.1
Moderate learning difficulty		-7.2
Specific learning difficulty		-4.7
Speech, language and communication		0.2
Autism spectrum disorder		-11.3
Sensory impairment		-1.3
Severe or multiple learning difficulties		-38.8
Physical and other disabilities		-15.3

The two models compared in this table both included the demography, deprivation and prior attainment variables shown in Table 18, but the coefficients are not repeated here as the changes in them were small and unimportant. The coefficients for different types of primary SEN are quite varied, confirming that being identified as experiencing a specific type of SEN is an important predictor of GCSE attainment over and above simply having or not having SEN. The coefficient of greatest magnitude relates to BESD, a category in which there are disproportionate numbers of CIN and CLA. Primarily for that reason, the addition of SEN to the model decreased all the coefficients for CIN and CLA by 6-12 GCSE points, equivalent to one or two grades in a single subject. While the disadvantages suffered by children in need and those looked after for shorter durations remain fairly large, after pupil characteristics and (more importantly) school effects have been taken into account, CLA-LT made less progress by a little more than three grades (19.4 points) overall at GCSE than children who were not in need or looked after.

School Context and School Type Effects

An important objective of this study was to understand the associations between schools or local authorities and the GCSE outcomes of children who were looked after. Variation in average outcomes at these organizational levels can arise for different reasons. GCSE outcomes might vary among schools or local authorities because of different institutional effectiveness, or because of differences in the mix of pupils they educate. Part of the variation among intakes is taken into account by including pupil prior attainment and other individual characteristics as explanatory variables, but in contextual value-added (CVA) models it is also common to include variables such as prior attainment or entitlement to FSM, aggregated to the higher levels. In such models, the coefficients on compositional variables might be explained by peer effects, perhaps operating through social comparison or by 'school climate', but can also reflect variability in outcomes arising from unmeasured (or poorly measured) variations in intake.

Table 16 showed that allowing for variability among schools accounted for more than half of the differences between the outcomes of CIN or CLA and other children. To investigate compositional effects, after we had added pupil-level variables to the model, we included three compositional variables for attainment at age 11, eligibility for FSM, and SEN status of school action plus or greater. Table 20 shows the changes in the coefficients for CIN and CLA, along with the coefficients on the school-level variables we

included and the residual variances at the three levels. Adding school context and type variables had little impact on fixed coefficients at the pupil level and we do not reproduce them all in this table.

The addition of school context terms to the model yielded large coefficients on the compositional terms (second column of estimates). The coefficient for school SEN was surprisingly large, bearing in mind that the SEN status coefficients at the individual level were virtually unchanged by the inclusion of school type. A pupil with BESD achieved 45 points fewer than pupils without SEN (see Table 19) but scored a further 126.7 points lower if they were in a school in which all pupils had a special educational need (albeit offset by the similarly large positive coefficient on the FSM compositional term, indicating that these two context measures are confounded).

Table 20: Contextual and School Type effects - GCSE Points coefficients and variances[(a)]

	Special Educational Needs model	School Context model	School Type model	No School Effects model
In need and looked after status				
In need on 31 March 2013	-44.6	-43.5	-43.6	-45.1
Looked after on 31st March 2013 for less than a year	-68.4	-68.3	-66.9	-71.1
Looked after on 31st March 2013 for over a year	-19.4	-18.1	-17.5	-18.3
School Contextual terms				
School mean KS2 points[(b)]		31.8	27.9	26.8
School FSM (proportion)		97.1	47.2	35.1
School SEN (proportion)		-126.7	-6.3	7.3
School Type Coefficients				
Special School			-91.6	-95.2
Community School			-6.1	-5.9
Pupil Referral Unit			-167.1	-175.8
Academy-Sponsor Led			3.1	4.9
Voluntary Controlled			-4.8	-5.0
Foundation School			-7.4	-6.4
Voluntary Aided			-2.3	-1.9
Alternative Provision			-177.4	-184.9
Independent			-3.3	-1.3
FE Sector College			-100.6	-109.1
Other			-69.4	-11.1
Residual Variances				
Local Authority	0	71	28	-
School	5,430	1,953	700	-
Pupil	3,165	3,167	3,171	3,541

Notes: (a) The models in the table also include all the pupil level variables shown in Tables 17-19, but as adding the school level variables had little impact on the pupil level coefficients, they are not shown here. (b) School mean KS2 points had mean=4.629 and SD=0.374, so a one unit change from a school KS2 mean of 4.13 to 5.13 represents a contrast between a school at the 9th and the 91st percentiles.

However, school type is perhaps the most powerful predictor of GCSE performance. The very large coefficients for different school types appear to explain nearly all of the differences in GCSE outcomes associated with SEN composition, and a large proportion of the differences apparently related to school mean prior attainment and proportion eligible for FSM.

Importantly, CIN and CLA pupils are disproportionately represented in school types with very large negative coefficients (Special schools, PRU, Alternative Provision, FE colleges), which also have a strong association with their GCSE attainment. It seems likely that the large differences in GCSE outcomes by school type reflects unmeasured characteristics of the intakes of the different school types. That is, there is powerful sorting in the English secondary education system into school types related to perceived academic potential, which is not adequately accounted for by pupils' prior attainments and special educational needs. The negative coefficient for FE sector colleges, for example, likely reflects the sorting of particular kinds of pupils under the age of 16 into FE colleges as opposed to mainstream schools.

The final three rows of Table 20 show estimates of variation in GCSE outcomes associated with the school and local authority levels. Before contextual terms were added to the model, the school level accounted for nearly two thirds of unexplained variation in GCSE scores (5,430 versus 3,165 at the pupil level). This is far more than in typical value-added models (which usually exclude certain types of school such as special schools, PRUs, and AP). Adding compositional terms to the model reduced the unexplained variation at the school level by more than 60% (to 1,953). The addition of type of school to the model reduced variance at the school level again by nearly 60% (to 700). Thus, variation in GCSE outcomes at the school level is not as large or important as the initial models suggested.

To determine how far the poorer performance of CIN and CLA pupils might be accounted for by the remaining variation in the apparent effectiveness of schools (that is, CIN and CLA pupils attending 'worse' rather than 'better' schools, having already taken account of pupil characteristics, school context and type), we fitted a single level model in which school effects were omitted but pupil characteristics, school type and composition were retained (shown in the final column of Table 20). The fixed coefficients for CIN and CLA pupils in the school type model only changed by 0.8 points for CLA pupils and 1.5 points for CIN pupils. Even if all the changes between the two models were attributed to school effectiveness, such differences between schools would not contribute much to the poorer outcomes of CIN and CLA. This conclusion should be qualified by observing that the school effect here is after accounting for school context, type and student intake. As well as being more likely to attend school types at which GCSE results are much poorer, CIN and CLA are more likely to attend schools where the mean KS2 score is lower. Table 12 showed that CIN and CLA pupils attended schools in which mean KS2 points were 0.8 of a point lower and proportions eligible for FSM were 5-10% higher. These compositional terms work in opposite directions on the coefficients for CIN and CLA, but mean KS2 points (with a coefficient of 27.9 in the School Type model) is much more influential. Overall, after accounting for all measured variables (considered to be outside the control of schools), CLA achieve around three grades lower at GCSE than other children and attend schools in which the mean KS2 score is lower, but the individual school (as opposed to whether or not it is mainstream) contributes little to the lower scores of CLA.

Residual variance at the LA level was very small in all models, suggesting that local authorities had little influence on GCSE outcomes overall. For example, in Table 20, in the most comprehensive model (School Type) the LA accounts for just 0.7% of the variance in pupil progress from age 11-16, while schools account for 18% and pupils 81%. It is unsurprising, given the very small size of the residual variance at the LA level, that when coefficients on compositional terms at the LA level were also examined, all were non-significant. We return later to the question of the influence of LAs specifically on CIN and CLA.

Attendances, Exclusions and School Mobility

The next stage in our modelling was to test pupil mobility between schools, and then pupil attendance and exclusion as mediating variables. Estimates of the coefficients in these models are shown in Table 21. The coefficients on the mediating variables are not important in themselves. Change of school

during KS4 has the largest coefficients, and the net effect of the coefficients with opposite signs is that changing school except during the summer holiday was associated with a reduction of 60 in GCSE points. The impact on the CIN and CLA coefficients was much less, accounting for 5-10 points for the different groups.

Table 21: School Mobility, Attendance and Exclusion Coefficients -Total GCSE Points

	School Type model	School mobility model	Media -tion model
In need on 31 March 2013	-43.6	-38.5	-19.8
Looked after on 31st March 2013 for less than a year	-66.9	-56.5	-42.0
Looked after on 31st March 2013 for over a year	-17.5	-12.3	-13.8
Changed school in year 10 or 11, between July & September		87.5	59.4
Changed school in year 10 or 11, between October and June		-153.0	-96.9
Changed school in year 9, between October and June		-21.9	-10.9
Changed school in year 8 or 9, between October and June		-10.5	-2.2
Number of half days of authorised absence			-0.2
Number of half days of unauthorised absence			-0.4
Number of fixed-term exclusions			-3.9
Number of half days of fixed-term exclusion			-0.4
Whether the child has ever been permanently excluded			-7.7

The net effect of changing school during term-time dropped when absence and exclusion were added to the model. The link between permanent exclusion and change of school (noted in the Descriptive Analysis) must account in part for this reduction – change of school serves as a proxy for exclusion when exclusion is not in the model. Absence and exclusion have a larger impact than mobility on the fixed coefficients for CIN and CLA. The fixed coefficient for CIN was reduced by nearly half (-38.5 to -19.8), and for those looked after for less than 12 months the fixed coefficient was reduced by more than a quarter (-56.5 to -42.0). Differences in the absence and exclusion rates in Table 14 suggest that unauthorised absence is the primary explanation for the large changes in the fixed coefficients for CIN and short-term CLA. The coefficient for those looked after in the longer term hardly changed (-12.3 to -13.8) because this subgroup does not have significantly different experiences of absence and exclusion from those who were not in need or looked after.

Experience of school, in terms of changing school, absences and exclusion, had a significant impact on residual variance, reducing it by a third at the pupil level and by a fifth at the school level (figures not shown). We cannot be sure whether absence and exclusion have a direct detrimental impact or merely signal disaffection, and perhaps behavioural issues, that also affect learning.

A little care should be exercised in interpreting these findings. Because absence and exclusion data were missing for large numbers of schools (mostly within certain school types), estimates at the school level in particular may not be exactly comparable between models. For this reason, and because these mediating variables were not a critical part of the investigation, we omitted absence and exclusion variables from subsequent models.

Differences in Coefficients for Looked after Children

Because we wanted to know whether the factors that related to GCSE attainment were substantively different between children who were looked after and those who were not, we next added to our model

interaction terms that estimated differences in all the coefficients. These estimates are in Table 22. Because we were making comparisons with CIN, we included separate interaction terms for CLA and CIN (but did not include a separate term for the smaller sub-group who were looked after for less than 12 months). We omit from Table 22 estimates of the separate coefficients associated with being looked after or in need – when the model includes interaction terms, these coefficients convey little useful information on their own.

Table 22: GCSE Attainment Model - Coefficients for interaction terms (GCSE Points)

	School mobility model	Interactions Model		
		Not CIN or CLA for 12 months	In need	CLA for 12 months
KS2 English points	21.4	21.8	-6.0	-6.2
KS2 Maths points	21.6	21.7	-4.6	-1.5
KS2 Science points	12.9	13.0	-0.2	-3.3
Male	-16.8	-17.0	7.9	1.4
Asian and Black African	15.7	15.4	9.0	14.2
Black Caribbean and Mixed White & Black Caribbean	5.2	4.7	13.2	-3.9
Other mixed heritage	7.4	7.0	8.6	6.0
Traveller	-36.8	-37.6	15.3	-1.7
Other ethnic group	15.0	15.1	-2.3	-14.6
Ethnic group not known	2.5	1.8	19.8	-25.1
English as an Additional Language (EAL)	12.7	12.8	0.8	-8.5
FSM6 (Eligible for FSM in any of the 6 years Y7-Y11)	-12.8	-12.8	4.7	5.8
Income Deprivation Affecting Children Index (IDACI)	-31.9	-31.9	12.3	-3.0
Behavioural, emotional and social difficulties (BESD)	-40.9	-41.2	-0.8	12.9
Moderate learning difficulty (MLD)	-6.7	-6.3	-2.7	-10.0
Specific learning difficulty (SpLD)	-5.1	-4.5	-11.7	2.6
Speech, language and communication needs (SLCN)	-0.5	0.0	-5.3	-6.9
Autism spectrum disorder (ASD)	-10.1	-9.4	-3.5	-36.2
Multi-Sensory impairment (MSI)	-0.9	-0.5	-1.5	-16.3
Severe or multiple learning difficulties (SLD & PMLD)	-36.6	-38.8	2.7	-35.0
Physical disabilities (PD)	-14.4	-15.1	8.0	-1.5

This table shows coefficients in the interactions model. The first column of estimates gives coefficients from a corresponding model without interaction terms; the second shows the coefficients for children who were not in need or looked after; the third and fourth show the marginal associations of being in need and looked after with GCSE outcomes. In previous tables, nearly all the coefficients have been statistically significant at the 5 % level and we did not highlight them. The estimates in the two right hand columns are based on smaller numbers and fewer of them are significant. Cells containing coefficients that are significant at the 5% level are shaded grey.

The interaction terms for previous attainment are all negative. That is, the impact on GCSE outcomes of being in need or being looked after appears to be greater for pupils whose KS2 attainment was higher. However, the 'floor' of 2.5 for the KS2 test scores weakens the relationship between KS2 and GCSE scores, and the negative coefficients for CIN and CLA may be partly an artefact of this. Because higher proportions of children in need and looked after score the minimum at KS2, the relationship between KS2 and GCSE scores is weaker for them than for other children.

For the CIN and CLA groups, there are small positive interaction coefficients associated with being male, eligible for free school meals and living in more deprived neighbourhoods. This shows that the

negative association with attainment of these factors is somewhat lower in the CIN and CLA groups. For example, pupils eligible for FSM typically have GCSE scores -12.8 points lower than predicted by the model, but for CIN the FSM effect is -8.1 points (-12.8+4.7) and for CLA just -7.0 points (-12.8+5.8). There is no clear pattern to the interaction terms for the ethnic groups in Table 22.

The interaction terms associated with SEN are mostly negative, and this is a different pattern from the attainment and demographic variables – CIN and CLA pupils with SEN tend to achieve lower GCSE scores than non-CIN/CLA pupils with the same SEN. This poorer performance might arise because the process of identification of CIN and CLA selects children with more acute educational needs, although these results could also be consistent with CIN and CLA being less likely to receive appropriate provision. The coefficients associated with CLA who have autism spectrum disorder (ASD) or severe or multiple learning difficulties (SMLD) are particularly large. CLA pupils with these SEN achieve substantially lower GCSE scores than pupils with the same SEN who are not in need or looked after at GCSE (by 36.2 and 35 points, respectively). While the numbers of children in these sub-groups are not large, it would be useful to know which explanation accounts for the poor GCSE performance of CLA pupils. Importantly, however, pupils with BESD who are looked after do relatively better (12.9 points, equating to two GCSE grades) than pupils with BESD who are not looked after or in-need. This is important because BESD is by far the largest group, accounting for 50% of the CLA-LT pupils with an identified SEN (see Table 9). This finding is consistent with LA care having a protective effect for such children.

Differential School and Local Authority effects for CLA, CIN and other students

Fitting a three level model tells us how much of the unexplained variability in GCSE outcomes is associated with the pupil, school local authority levels, but the models we fitted up to this point assumed that the unexplained variability was the same for the CIN and CLA groups as for other pupils. We might expect that the GCSE outcomes of CIN and CLA are more variable than those of other pupils, and that some of this additional variability will be observed at the higher levels. For instance, schools might vary more in their effectiveness at teaching children in need because their education requires specific skills, and the GCSE outcomes for the CLA group might vary among LAs because of variability in the stringency of criteria used when deciding whether to take a child into care. To investigate whether there is differential, unexplained variability in GCSE outcomes at all three levels, we added random coefficients to the model. The resulting estimates of residual variances and co-variances are shown in Table 23.

Table 23: Residual Effects with Random CIN and CLA terms

Children in Need[(a)]

	Pupil		School		Local Authority	
	Not in need	In need	Not in need	In need	Not in need	In need
Not in need	3,008		680		30	
In need	0[(b)]	7890	749	1375	30	86

Looked after on 31st March 2013 for over a year [(a)]

	Pupil		School		Local Authority	
	Not CLA	CLA	Not CLA	CLA	Not CLA	CLA
Not CLA	3140		681		29	
CLA	0[(b)]	6889	741	1201	20	91

Notes: (a) The top table shows variance and covariance estimates in a 3-level model with random terms for CIN and a contrast against the progress of pupils Not-CIN. The lower table show a similarly structured model but with a random coefficient for CLA for 12 months and a contrast against progress for pupils not CLA for 12 months or more. (b) Constrained to zero since a pupil cannot be both CIN and non-CIN (or both CLA and Non-CLA). The full results of the CLA model are given in Appendix D.

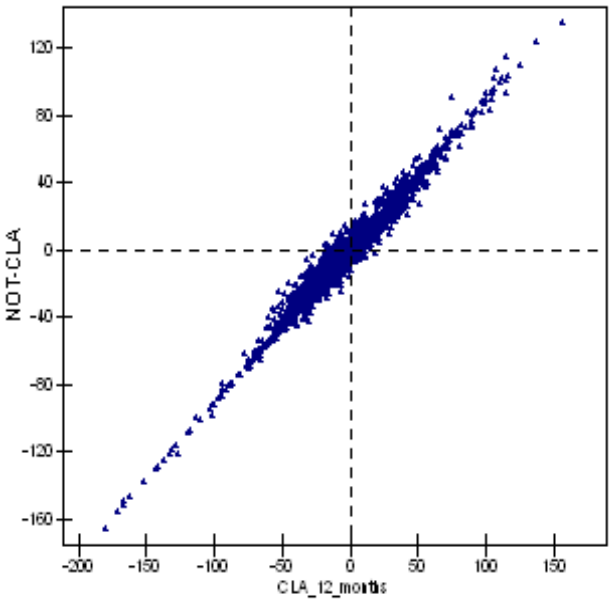
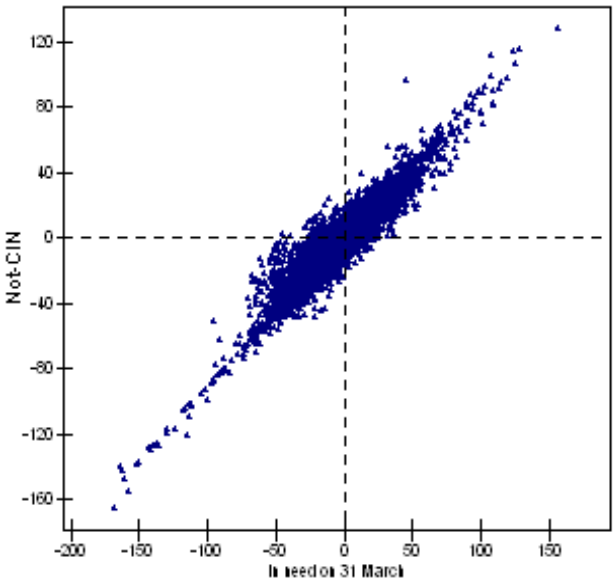
The first key message from Table 23 is that CIN pupils have much more variable outcomes than non-CIN pupils, and likewise CLA pupils have much more variable outcomes than non-CLA pupils. It is plausible, but we cannot confirm with these data, that variation in non-school environments accounts for these different amounts of variability in educational outcomes. If that is part of the explanation, then there is less non-school environment variability for CLA than for CIN who are not looked after.

The second key message is that variance terms at the LA level are an order of magnitude lower than those at the school level, which are in turn several times lower than those at the pupil level. The uniformly small variance and covariance terms at the LA level indicate that local authorities have little influence on the GCSE outcomes of any pupils, including CIN and CLA pupils.

The third key message is that schools that do well for their non-CLA pupils also do well for their CLA pupils. Indeed, the correlation between schools' contextual value added (CVA) for CLA pupils and their non-CLA pupils is 0.82. Figure 1 graphs this relationship. A similar phenomenon is seen when comparing schools' CVA for CIN vs. those 'Not CIN', although the correlation is somewhat lower (r=0.77).

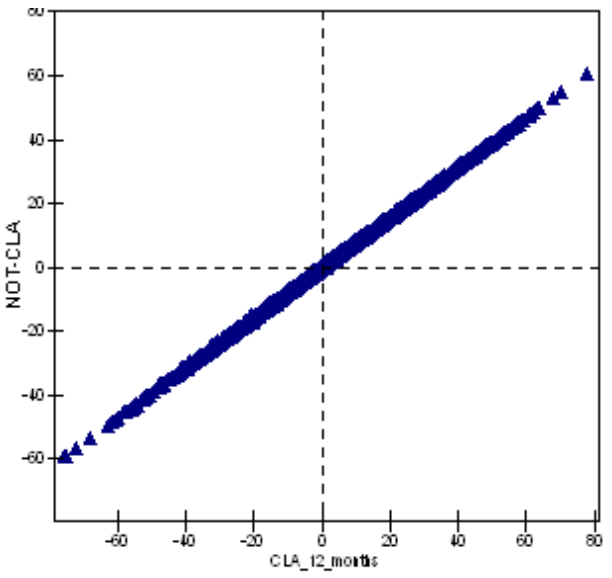
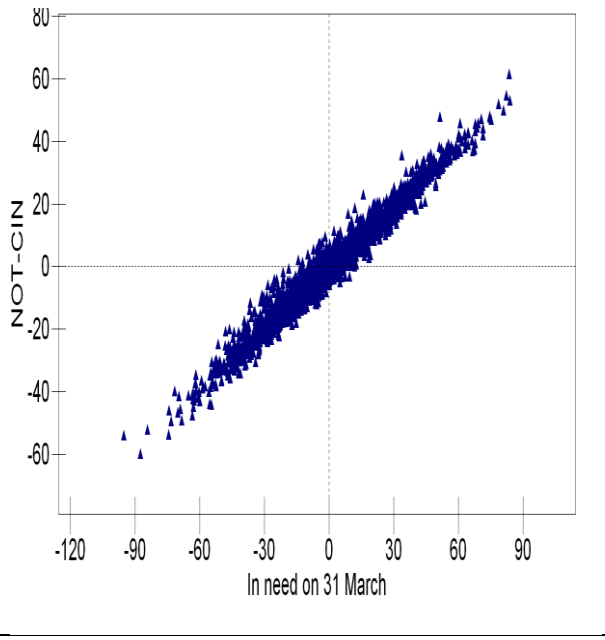
The fourth message is that the above correlations are actually underestimates of the true strength of these relationships because of the very diverse nature of the 5,600 'schools' being compared, including Special Schools, Alternative Provision, PRUs, FE colleges, Secure Units and so on. The residual variance terms we see at the school level in Table 23 might reflect differential school performance for these pupils, but might equally well reflect unmeasured differences in school intakes. If we restrict the analysis to the 3,000 maintained mainstream schools, the correlations rise to r=0.98 between school CVA for CLA and Non-CLA pupils and r=0.84 between school CVA for CIN and Non-CIN students. These relationships are graphed in Figure 2.

Figure 1 : GCSE Best 8 Points School Residuals – CLA and CIN models (All school types)

CLA for 12 months or more vs. Not-CLA for 12 months or more (r=0.82)	CIN vs. Not CIN (r=0.77)
	

Note: The full results of the CLA model are given in Appendix D.

Figure 2 : GCSE Best 8 Points School Residuals – CLA and CIN models (Maintained Mainstream schools only)

CLA versus Not-CLA (r=0.976)	CIN vs. Not CIN (r=0.843)
	

Note: for a breakdown of school types and the number of CLA/CIN pupils in each, see Appendix C.

This analysis within mainstream schools is important for policy, since the choice of where to place a pupil is rarely a free choice between specialist provision on the one hand (e.g. PRU, special school, Alternative Provision) and a mainstream school on the other. More frequently, choice is constrained. In terms of policy we conclude that a school that does well for its non CLA/CIN students will also tend to do

well for CLA pupils and so, all other things being equal, would be preferred. This is supportive of reforms to school admissions that give priority to CLA pupils.

English and Maths Models

There were no obviously important differences between these models and the overall GCSE points models. Predictability was lower because each is a single test and there were fewer significant coefficients. Unsurprisingly, KS2 English score was by far the best predictor of GCSE English performance, and KS2 Maths score was by far the best predictor of GCSE Maths performance, but this has no repercussions for estimating the impact of being CIN or CLA. Otherwise, the coefficients in these models were broadly consistent with those in the overall GCSE points models.

Summary of Main Findings

i. Children who are looked after (CLA) are effectively a subset of children in need (CIN). Relative to children who were not in need, CIN were relatively deprived according to measures of family and neighbourhood poverty, were more likely to have special educational needs, had poor attendance and more exclusions from school, and had progressively poorer relative attainment as they went through school.

ii. CLA have a higher proportion than average of students from groups with lower than average attainment (e.g. male, economically disadvantaged or Black Caribbean). They were more likely to start life in economically poorer families (on average), but subsequently move into less deprived neighbourhoods.

iii. Special educational needs are more prevalent amongst CIN and CLA, and their types of need are likely to be greater than those of other children. CLA more often have behavioural needs, while CIN more often have major learning difficulties and ASD.

iv. The educational experiences of CIN and CLA are generally worse than those of other children. They have more changes of school, lower attendance and more exclusions, but children who had been looked after on 31st March 2013 for over a year (CLA-LT) had slightly better experiences than other CIN and CLA.

v. The attainments of CIN and CLA are lower than those of other children throughout primary and secondary education. Children who were admitted to care in the final 12 months of secondary education (not necessarily for the first time) made least progress during KS4. CLA-LT made more progress during Key Stages 2-4 than either CIN or other CLA.

vi. Demography and deprivation account for relatively small proportions of the differences in GCSE outcomes between CIN, CLA and other children. Their special educational needs account for a larger part of the difference. The type of school children attend – which is strongly related to the poverty and educational needs of their peers – is a very powerful predictor of GCSE outcomes, and when taken into account in a statistical model, more than halves the apparent disadvantage suffered by CIN and CLA. This suggests that unmeasured characteristics that influence outcomes are strongly related to selection into different school types.

vii. Overall pupils who were looked after had similar GCSE outcomes to children in need. However, those recently admitted to care in the year preceding their GCSEs performed relatively worse, while those

CLA for 12 months or more performed relatively better. This is consistent with continuing LA care having a protective effect on CLA. Further investigation of the relationship between stability of care and GCSE outcomes is in Technical Report 2.

viii. Absences, exclusions and changes of school explain substantive variations in GCSE outcomes and a significant part of the disadvantage CIN and CLA experience. Educational instability has a stronger association with GCSE results for CIN who are not looked after and CLA in short-term care. Unauthorised absence is the largest mediating factor. Differences in permanent exclusion rates explain much of the differences in rates of changes of school – exclusion is probably closer than change of school to the root cause of differences in GCSE outcomes between these groups.

ix. Interactions between being in need or looked after and other explanatory variables arise from the way the variables are measured, or what they mean for the different groups. Measures of deprivation (FSM and IDACI) change more over time for the CLA group than for other children, presumably because their caring arrangements change. This makes deprivation measures weaker predictors of GCSE outcomes for CIN and CLA than for other children.

x. The GCSE outcomes of pupils with autism spectrum disorder or severe or multiple learning difficulties seem to be much poorer for CLA pupils than for those not CIN/CLA. Conversely, however, CLA pupils with BESD achieve better outcomes than pupils identified with BESD who are not in need or looked after.

xi. The extremely small effects at the LA level (<1% of the variance in pupil progress), while surprising, should not mask the effects on pupils of a number of factors at the school and pupil levels which reflect an LA's policy and practice including care and school placement.

xii. Effects were larger at the school level, particularly for CIN (around 18% of the variance in pupil progress). However, schools that showed strong pupil progress for non-CLA or non-CIN students also showed strong progress for CLA and CIN pupils. This was even more the case if we restrict the analysis to maintained mainstream schools. We conclude that a school that does well for its non CLA/CIN students typically also does well for CLA pupils and so, all other things being equal, would be preferred. This is supportive of reforms to school admissions that give priority to CLA pupils.

Conclusions

The demographic characteristics of CLA are no better (from an educational standpoint) than CIN, their educational needs are similar in prevalence and severity, and their earlier attainment is worse, yet children who are looked after over the longer term outperform CIN at GCSE. When other factors are taken into account, children who are looked after over the longer term are less disadvantaged educationally than children who are in need but not looked after. One cannot infer the reasons for that from a regression, whether simple or multilevel. Nevertheless, the findings are consistent with the explanation that local authority care provides an environment that is more conducive to education than that experienced by children in need.

Appendix A: Variable names and labels

PMR	Pupil matching reference	Pupil flags
CLA_31_March	Pupil was looked after at 31 March 2013	
CLA_12_MONTHS	Pupil was looked after on 31st March 2013 for over a year	
CINAt31March_2013	Pupil was a child in need at 31 March 2013	
KS4_LA	Local authority of school at key stage 4	LA and school identifiers
KS3_LA	Local authority of school at key stage 3	
KS2_LA	Local authority of school at key stage 2	
KS1_LA	Local authority of school at key stage 1	
LA_SPR13	Local authority of school at Spring 2013 Census	
LA_SPR11	Local authority of school at Spring 2011 Census	
LA_SPR08	Local authority of school at Spring 2008 Census	
LA_04	Local authority of school at 2004 Census	
HomeLA_SPR13	Local authority of home at Spring 2013 Census	
HomeLA_SPR11	Local authority of home at Spring 2011 Census	
HomeLA_SPR08	Local authority of home at Spring 2008 Census	
KS4_LAESTAB	School (unique ID) at key stage 4	
KS3_LAESTAB	School (unique ID) at key stage 3	
KS2_LAESTAB	School (unique ID) at key stage 2	
KS1_LAESTAB	School (unique ID) at key stage 1	
LAEstab_SPR13	School (unique ID) at Spring 2013 Census	
LAEstab_SPR11	School (unique ID) at Spring 2011Census	
LAEstab_SPR08	School (unique ID) at Spring 2008 Census	
LAEstab_04	School (unique ID) at 2004 Census	
KS4pts_TNEWE	KS4 points, total, A*=64, +equivalents	GCSE points
KS4pts_CNEWE	KS4 points, 8 best, A*=64, +equivalents	
KS4pts_TNEWG	KS4 points, total, A*=64, GCSE only	
KS4pts_TOLDG	KS4 points, total, A*=8, GCSE only	
KS4pts_PNEWG	KS4 points, per entry, A*=64, GCSE only	
KS4pts_PNEWE	KS4 points, per entry, A*=64, +equivalents	
KS4pts_Maths	KS4 points, Maths	
KS4pts_English	KS4 points, English	
KS3pts_English	KS3 points in English(teacher-assessed)	Previous attainment
KS3pts_Maths	KS3 points in Maths (teacher-assessed)	
KS3pts_Science	KS3 points in Science (teacher-assessed)	
KS2pts_English	Finely graded level of KS2 English test	
KS2pts_Maths	Finely graded level of KS2 Maths test	
KS2pts_Science	Finely graded level of KS2 Science test	
KS2pts_APS	KS2 points, 3-test average	
KS2pts_APSSQ	KS2 points, 3-test average, squared	
KS1_READOTPS	KS1 points, reading test	
KS1_WRITOTPS	KS1 points, writing test	
KS1_MATHSOTPS	KS1 points, maths test	

KS1_SCISUBOTPS	KS1 points, science test	
KS4_GENDER	Gender	Pupil characteristics
KS4_YEAROFBIRTH	Year of birth	
KS4_MONTHOFBIRTH	Month of birth	
EthnicGroupMinor_SPR13	Ethnic group (19 categories), Spring 2013	
EthnicGroupMinor_SPR11	Ethnic group (19 categories), Spring 2011	
FSMeligible_SPR13	Eligible for free school meals at 2013 Census	
FSMeligible_SPR11	Eligible for free school meals at 2011 Census	
FSMeligible_SPR08	Eligible for free school meals at 2008 Census	
FSMeligible_04	Eligible for free school meals at 2004 Census	
KS4_FSM6	Eligible for free school meals in any of 6 years before key stage	
EVERFSM_6_SPR13	Eligible for free school meals in any of 6 years before 2013 Census	
EVERFSM_6_SPR11	Eligible for free school meals in any of 6 years before 2011 Census	
IDACIScore_SPR13	Local deprivation index, Spring 2013	
IDACIScore_SPR11	Local deprivation index, Spring 2011	
IDACI_08	Local deprivation index, Spring 2008	
IDACI_04	Local deprivation index, 2004	
KS4_EALGRP	English as an additional language, (4 categories) at key stage 4	
LanguageGroupMinor_SPR13	Pupil's language group (10 categories) at 2013 Census	
LanguageGroupMinor_SPR11	Pupil's language group (10 categories) at 2011 Census	
LanguageGroup_SPR08	Pupil's language group (7 categories) at 2008 Census	
FirstLanguage_04	Pupil's language group (6 categories) at 2004 Census	
SENprovision_SPR13	Type of SEN provision (4 categories) at 2013 Census	
SENprovision_SPR11	Type of SEN provision (4 categories) at 2011 Census	
SENprovision_SPR08	Type of SEN provision (4 categories) at 2008 Census	
SENstatus_04	Type of SEN provision (4 categories) at 2004 Census	
PrimarySENtype_SPR13	Primary type of special educational need (10 categories) at 2013 Census	
PrimarySENtype_SPR11	Primary type of special educational need (10 categories) at 2011 Census	
PrimarySENtype_SPR08	Primary type of special educational need (10 categories) at 2008 Census	
PrimarySENtype_04	Primary type of special educational need (10 categories) at 2004 Census	
SecondarySENtype_SPR13	Secondary type of special educational need (10 categories) at 2013 Census	
SecondarySENtype_SPR11	Secondary type of special educational need (10 categories) at 2011 Census	
SecondarySENtype_SPR08	Secondary type of special educational need (10 categories) at 2008 Census	
SecondarySENtype_04	Secondary type of special educational need (10 categories) at 2004 Census	
DistCurrSch_SPR13	Distance from home to school at 2013 Census	Pupil characteristics

Sch_mob_Yr1011	Changed school in year 10 or 11	
Sch_mob_Yr1011_term	Changed school in year 10 or 11 between October and June	
Sch_mob_Yr1011_termv2	Changed school in year 10 or 11 (12 September cut-off date)	
Sch_mob_Yr9	Changed school in year 9	
Sch_mob_Yr89_term	Changed school in year 8 or 9 between October and June	
Sch_mob_Yr6	Changed school in year 6	
Sch_mob_Yr5	Changed school in year 5	
Sch_mob_Yr34	Changed school in year 3 or 4	
SessionsPossible08	Possible attendances (half days) in 2007/08	Absences
AuthorisedAbsence08	Authorised absences (half days) in 2007/08	
UnauthorisedAbsence08	Unauthorised absences (half days) in 2007/08	
PropAuthorised08	Authorised absences as a proportion in 2007/08	
PropUnauthorised08	Unauthorised absences as a proportion in 2007/08	
SessionsPossible09	Possible attendances (half days) in 2008/09	
AuthorisedAbsence09	Authorised absences (half days) in 2008/09	
UnauthorisedAbsence09	Unauthorised absences (half days) in 2008/09	
PropAuthorised09	Authorised absences as a proportion in 2008/09	
PropUnauthorised09	Unauthorised absences as a proportion in 2008/09	
SessionsPossible10	Possible attendances (half days) in 2009/10	
AuthorisedAbsence10	Authorised absences (half days) in 2009/10	
UnauthorisedAbsence10	Unauthorised absences (half days) in 2009/10	
PropAuthorised10	Authorised absences as a proportion in 2009/10	
PropUnauthorised10	Unauthorised absences as a proportion in 2009/10	
SessionsPossible11	Possible attendances (half days) in 2010/11	
AuthorisedAbsence11	Authorised absences (half days) in 2010/11	
UnauthorisedAbsence11	Unauthorised absences (half days) in 2010/11	
PropAuthorised11	Authorised absences as a proportion in 2010/11	
PropUnauthorised11	Unauthorised absences as a proportion in 2010/11	
SessionsPossible12	Possible attendances (half days) in 2011/12	
AuthorisedAbsence12	Authorised absences (half days) in 2011/12	
UnauthorisedAbsence12	Unauthorised absences (half days) in 2011/12	
PropAuthorised12	Authorised absences as a proportion in 2011/12	
PropUnauthorised12	Unauthorised absences as a proportion in 2011/12	
SessionsPossible13	Possible attendances (half days) in 2012/13	
AuthorisedAbsence13	Authorised absences (half days) in 2012/13	
UnauthorisedAbsence13	Unauthorised absences (half days) in 2012/13	
PropAuthorised13	Authorised absences as a proportion in 2012/13	
PropUnauthorised13	Unauthorised absences as a proportion in 2012/13	
Sess_Poss_Total	Possible attendances (half days) in total	
Auth_Abs_Total	Authorised absences (half days) in total	
Unauth_Abs_Total	Unauthorised absences (half days) in total	

Prop_Auth_Total	Authorised absences as a proportion in total	
Prop_Unauth_Total	Unauthorised absences as a proportion in total	
Num_fixed_08	Number of fixed-term exclusions in 2007/08	Exclusions
Sessions_fixed_08	Sessions excluded (fixed-term) in 2007/08	
Num_perm_08	Number of permanent exclusions in 2007/08	
Num_fixed_09	Number of fixed-term exclusions in 2008/09	
Sessions_fixed_09	Sessions excluded (fixed-term) in 2008/09	
Num_perm_09	Number of permanent exclusions in 2008/09	
Num_fixed_10	Number of fixed-term exclusions in 2009/10	
Sessions_fixed_10	Sessions excluded (fixed-term) in 2009/10	
Num_perm_10	Number of permanent exclusions in 2009/10	
Num_fixed_11	Number of fixed-term exclusions in 2010/11	
Sessions_fixed_11	Sessions excluded (fixed-term) in 2010/11	
Num_perm_11	Number of permanent exclusions in 2010/11	
Num_fixed_12	Number of fixed-term exclusions in 2011/12	
Sessions_fixed_12	Sessions excluded (fixed-term) in 2011/12	
Num_perm_12	Number of permanent exclusions in 2011/12	
Num_fixed_13	Number of fixed-term exclusions in 2012/13	
Sessions_fixed_13	Sessions excluded (fixed-term) in 2013/13	
Num_perm_13	Number of permanent exclusions in 2012/13	
Num_fixed_Total	Number of fixed-term exclusions in Total	
Sessions_fixed_Total	Sessions excluded (fixed-term) in Total	
Perm_excl_ever	Whether pupil ever permanently excluded	
School_type	Type of school	School and LA level variables
School_size	Size of school	
School_KS2pts	Cohort mean of KS2 points	
School_FSM_eligibility_13	Proportion of pupils eligible for FSM	
School_Eng_spkrs_KS4	Proportion of pupils whose first language is English	
School_Females_KS4	Proportion of pupils who are female	
School_WBRI_13	Proportion of pupils who are White British	
School_SEN_08	Proportion of pupils with SEN - school action plus or above	
LA_size	Size of LA	
LA_KS2pts	LA Cohort mean of KS2 points	
LA_FSM_eligibility_13	LA proportion of pupils eligible for FSM	
LA_Eng_spkrs_KS4	LA proportion of pupils whose first language is English	
LA_WBRI_13	LA proportion of pupils who are White British	
LA_CLA_13	LA proportion of pupils in local authority care	
LA_SEN_08	LA proportion of pupils with SEN - school action plus or more	
LA_Residential	LA proportion of care provided in residential homes	
LA_Foster	LA proportion of care provided by foster parents	
DateEarliestEntry	Date Earliest Entry into Care	n

AgeFirstEnter	Age at First Entry into Care	
AgeYearsFirstEnter	Age at First Entry into Care in Years	
AgeGroupFirstEntry	Age Group at First Entry	
DateLatestEntry	Date Latest Entry into Care	
AgeLatestEntry	Age of Latest Entry into Care	
AgeYearsLatestEntry	Age of Latest Entry into Care in Years	
AgeGroupLatestEntry	Age Group Years at Latest Entry	
CINFirstEntry	Reason for first entry into care	
AbuseFirstEntry	First entry into care because of Abuse or Neglect	
DisabilityFirstEntry	First entry into care because of disability	
CINLatestEntry	Reason for entering care latest entry	
AbuseLatestEntry	Latest entry into care because of Abuse or Neglect	
DisabilityLatestEntry	Latest entry into care because of disability	
NumberofPlacementsOverall	Number of placements overall	Care stability
NumberofPlacementsOverallCats	Number of Placements Overall in Categories	
NumberofPlacementsafterKS2	Number of placements since beg of KS2	
NumberofPlacementinlast3years	Number of placements in last 3 years	
NumberofPlacementsincestartofKS4	Number of placements since start of KS4	
NumberofPeriodsinCare	Number of periods in care ever	
NewPeriodsinCaresinceKS2	Number of new periods in care after KS2	
MeanPlacementLength	Mean length of all placements	
MostRecentPlacementLength	Most Recent Placement length	
MostRecentPlacementLengthCat	Most recent placement length in categories	
LongestPlacementLength	Longest Placement Length	
LongestPlacementLengthCat	Longest placement length in categories	
DateLatestCarePeriodStarted	Date Last Care Period Started	
LengthofLastCarePeriod	Length of Latest Care Period	
LengthofLastCarePeriodMonths	Length of Latest Care Period in Months	
LengthTimeinCareOverall	Length of Time in Care Overall	Care duration and types
LengthTimeinCareOverallGroups	Length of time in care overall in categories	
LengthofTimeInCareKS2toKS4	Length of Time in care between beg of KS2 and KS4	
TimeinKinPlacements	Length of time spent in Kin Placements overall	
TimeinFosterPlacements	Length of time spent in foster Placements overall	
TimeinResidentialPlacements	Length of time spent in residential Placements overall	
TimeinOtherPlacements	Length of time spent in other Placements overall	
ResidentialCare_mean	Mean number of placements in residential care	
FosterCare_mean	Mean number of placements in foster care	
KinCare_mean	Mean number of placements in kinship care	
AlwaysinResidential	Has the child always been in residential care	
EverinResidential	Has the child ever been in residential care	
AlwaysinFosterCare	Has the child always been in foster care	
EverinFosterCare	Has the child ever been in foster care	
AlwaysinKinCare	Has the child always been in kinship care	

EverinKinCare	Has the child ever been in kinship care	
TimeinKinTimeOverall	Time in Kin placements as a proportion of time in care overall	
TimeinFCTimeOverall	Time in foster placements as a proportion of time in care overall	
TimeinResiTimeOverall	Time in Resi placements as a proportion of time in care overall	
TimeinOtherTimeOverall	Time in Other placements as a proportion of time in care overall	
TimeSinceFirstEntry	Time (elapsed) since First Entry into Care (only use to calculate next variable)	
TimeatHome	Time at Home since First Entry into Care	
TimeSinceKS2	Time (elapsed) since KS2 (only use to calculate next variable)	
TimeatHomeKS2KS4	Time at home between KS2 and KS4	
InCareatKS4	In Care at KS4 (census date rather than KS4 exam date)	
NumberofNewPlacementsAroundKS2	Number of Placements +/- 6 months of KS2	
Convicted	Mean Conviction rate / years data recorded	Risk factors and behaviours
SubstanceMisuse	Mean substance misuse problem rate / year data recorded	
EverConvicted	Has the YP ever been convicted?	
EverSubstanceMisuse	Ever Substance misusing?	
Parent	Is the YP a parent?	
DATE_UASC_CEASED	Date when Unaccompanied Asylum Seeker status ceased	
UASC	Is the child recorded as UASC?	
RefugeeStatus	Does the child have Refugee Status?	
SDQ_SCORE.2009	SDQ Score 2009	
SDQ_SCORE.2010	SDQ Score 2010	
SDQ_SCORE.2011	SDQ Score 2011	
SDQ_SCORE.2012	SDQ Score 2012	
SDQ_SCORE.2013	SDQ Score 2013	
SDQ_mean_stand	Mean standardised SDQ score	

PlacementatKS2	**Placement Type at KS2**	**Miscellaneous care variables**
PlacementatKS4	**Placement Type at KS4**	
CareerType	**What is the Career Type of the YP (1 to 6)**	
short_breaks_mean	**Mean value of number of respite placements**	
EverRespite	**Has the child ever been in respite care?**	
InCare12months	**Has this child been in care for the past 12 months?**	
InCare12monthsCENSUS	**Was this child in care for the last 12 months if in care on census date**	
NumberofNewPlacementsAroundKS26months	**Number of placements 6 months each side of KS2**	
NumberofCarePeriodsAroundKS26months	**Number of care periods 6 months each side of KS2**	
ReasonLastEpisodeCeased	**Reason last episode ceased / leaving care**	
LastPlacementProviderRecorded	**Provider of placement - last recorded**	
LastPlacementProviderRecordedGROUP	**Provided or placement GROUPED - last recorded**	
PlacementLocationatKS2	**In / Out LA at KS2**	
PlacementLocationatKS4	**In / Out LA at KS4**	
LongestPlacementLengthBYTimeinCare	**Ratio of longest placement by length of time in care overall**	
LastPlacementType	**What is placement last placement type?**	
LastPlacementTypeCats	**Grouped Last Placement Type**	
LastPlacementTypeFiveCats	**Five Groups of Placement**	

Appendix B: Cross-tabulation of pupils by CLA/CIN status and category of SEN

SEN		Neither CLA nor CIN	CIN	CLA<12	CLA-12+	Total
None	N	498831	5554	533	1365	506283
	COL %	84.3	41	38.8	28.4	82.8
ASD	N	6182	986	45	185	7398
	COL %	1.0	7.3	3.3	3.8	1.2
BESD	N	26269	2556	493	1737	31055
	COL %	4.4	18.9	35.9	36.1	5.1
HI	N	1902	106	7	21	2036
	COL %	0.3	0.8	0.5	0.4	0.3
MLD	N	24581	1442	143	683	26849
	COL %	4.2	10.6	10.4	14.2	4.4
MSI	N	70	14	0	0	84
	COL %	0	0.1	0	0	0
OTH	N	5108	307	39	233	5687
	COL %	0.9	2.3	2.8	4.8	0.9
PD	N	2450	414	5	40	2909
	COL %	0.4	3.1	0.4	0.8	0.5
PMLD	N	160	342	7	48	557
	COL %	0	2.5	0.5	1	0.1
SLCN	N	9267	315	21	131	9734
	COL %	1.6	2.3	1.5	2.7	1.6
SLD	N	1529	992	33	176	2730
	COL %	0.3	7.3	2.4	3.7	0.4
SPLD	N	14766	457	40	178	15441
	COL %	2.5	3.4	2.9	3.7	2.5
VI	N	925	64	7	15	1011
	COL %	0.2	0.5	0.5	0.3	0.2
	TOTALS	592040	13549	1373	4812	611774

Appendix C: Cross-tabulation of pupils by CLA/CIN status and school type

School type	Neither CLA nor CIN		CIN		CLA <12 mths		CLA 12 months or more		Total
Community School	155052	24.9%	2692	19.8%	240	17.3%	799	16.5%	158783
Special School	8010	1.3%	3204	23.6%	190	13.7%	1061	21.9%	12465
Pupil Referral Unit	5665	0.9%	822	6.0%	226	16.3%	323	6.7%	7036
Academy-Sponsor Led	59014	9.5%	1461	10.7%	132	9.5%	454	9.4%	61061
Academy-Converter Mainstream	203233	32.6%	2467	18.1%	215	15.5%	915	18.9%	206830
Voluntary Controlled School	9539	1.5%	140	1.0%	16	1.2%	58	1.2%	9753
Foundation School	69966	11.2%	1321	9.7%	144	10.4%	473	9.8%	71904
Voluntary Aided School	56257	9.0%	824	6.1%	68	4.9%	273	5.6%	57422
Alternative Provision	2347	0.4%	340	2.5%	93	6.7%	272	5.6%	3052
Independent	47061	7.6%	86	0.6%	11	0.8%	42	0.9%	47200
Further Education Sector College	5323	0.9%	210	1.5%	47	3.4%	169	3.5%	5749
Other	1503	0.2%	32	0.2%	5	0.4%	10	0.2%	1550
All schools	622970		13599		1387		4849		642805
Maintained Mainstream	553061	88.8%	8905	65.5%	815	58.8%	2972	61.3%	565753

Notes: School types in bold are not included in the maintained mainstream schools only analysis. Total number of schools 5,722 (161 excluded from analysis because of missing data). Total number of maintained mainstream schools 3,028 (15 excluded from analysis because of missing data).

Appendix D: Full results for the multiple regression for CLA differential school effects

Fixed Part		Coeff	SE
Constant		-49.10	7.38
CIN/CLA	In need on 31 March 2013	-43.62	0.55
	Looked after on 31st March 2013 for less than a year	-66.94	1.64
	Looked after on 31st March 2013 for over a year	-16.46	1.65
KS2	KS2pts_English	22.02	0.20
	KS2pts_Maths	22.11	0.18
	KS2pts_Science	13.56	0.21
Gender	Male	-16.03	0.17
SES	KS4_FSM6	-12.47	0.20
	IDACI_ever	-33.82	0.61
Language	EAL	12.64	0.40
Ethnicity	Asian and Black African	14.99	0.40
	Black Caribbean and MWBC	4.34	0.49
	Other mixed heritage	6.10	0.50
	Traveller	-50.68	2.13
	Other ethnic group	13.15	0.47
	Ethnic origin unknown	-3.19	0.62
SEN	Autism spectrum disorder	-9.48	0.75
	Behavioural, emotional and social	-44.89	0.38
	Hearing Impaired	1.98	1.32
	Moderate learning difficulty	-6.64	0.41
	Multi Sensory impairment	-12.44	6.40
	Physical Disabilities	-6.51	1.12
	Profound & Multiple LD	-36.78	2.89
	Speech, language % communication needs	0.48	0.62
	Specific learning difficulty	-31.68	1.49
	SPLD	-4.75	0.50
	Visually Impaired	-3.17	1.88
	Other SEN	-19.68	0.81
School Composition	School mean KS2 point score	28.73	1.48
	School_FSM6 (Proportion)	46.76	2.73
	School_SEN (Proportion)	-8.38	4.28
School Type (base=community school)	Special School	-82.09	3.32
	Pupil Referral Unit	-159.44	2.47
	Academy-Sponsor Led	9.39	1.75
	Academy-Converter Mainstream	5.82	1.31
	Voluntary Controlled School	1.44	4.10
	Foundation School	-1.26	1.68
	Voluntary Aided School	3.63	1.73
	Alternative Provision	-171.90	3.71
	Independent	2.43	1.72
	Further Education Sector College	-93.29	2.77
	Other type of establishment	-62.32	5.76

Random Part			
LA			
CLA_12_months/CLA_12_months	91.7	44.9	1
NOT-CLA/CLA_12_months	20.1	12.7	0.39
NOT-CLA/NOT-CLA	29.2	6.4	1
School			
CLA_12_months/CLA_12_months	1201.7	171.2	1
NOT-CLA/CLA_12_months	741.0	42.0	0.82
NOT-CLA/NOT-CLA	681.1	15.4	1
Pupil			
CLA_12_months/CLA_12_months	6889.2	203.1	
NOT-CLA/NOT-CLA	3140.1	5.9	
-2*loglikelihood:	6229985		
Units: LAs	152		
Units: Schools	5561		
Units: Pupils	570470		
Response	KS4pts_CNEWE		